Reviews.

The Bedford Oölitic Limestone of Indiana. By T. C. Hopkins and C. E. Siebenthal. Extr. 21st Ann. Rep. Dept. of Geology and Natural Resources (of Indiana). W. S. Blatchley, State Geologist, Indianapolis, 1896.

All of the older geological maps of Indiana show the various rocks across that state in broad, sweeping lines, and that, too, in spite of the fact that the rocks are everywhere nearly horizontal and have been deeply trenched by the streams. The last two reports of State Geologist Blatchley have shown a great improvement in this respect—the maps by Hopkins and by Kindle in the twentieth report and those by Hopkins and Siebenthal in the twenty-first report are by far the best that have yet appeared of the areas represented, showing, as they do, the dendritic form of outcrop to be expected.

From the earliest to the latest of the Indiana reports, almost every one has had something to say of the well-known oölitic limestone; but hitherto there has been no report on this rock that could lay claim to being a systematic description and discussion of it. The present report bears internal evidence of having been prepared under pressure, but it is nevertheless a highly creditable and valuable piece of work, and by far the best report ever made on the Bedford stone. The maps show a vast amount of field work, and exhibit for the first time the distribution of this valuable building stone. We are glad to see that the authors do not feel it incumbent upon themselves to "puff" the Bedford stone. This and every other good building stone, once it is given a chance, may be trusted to take care of its own reputation without any such help from geologists as that quoted on page 323. Evidently some people think the truth can be improved upon. What Mr. Hopkins says is certainly as much as reasonable people can ask. "The Bedford oölitic limestone can unhesitatingly be recommended as one of the most durable building stones on the market, where not exposed to the action of acids. It is fireproof up to the point of cal-

cination, in which property it can be surpassed by no other limestone and but few other building stones, as very few are absolutely fireproof." The list of the more important buildings made of the oölitic limestone at the end of the report shows that it is already used in almost every state of the Union, in which use the cities of Chicago, Indianapolis, and New York lead.

Statistics show that over six million cubic feet of Bedford stone was quarried in 1895, worth more than a million and a half of dollars; 1784 men were employed that year in the quarries, to say nothing of those engaged in stone-cutting, transportation, and building. The work includes valuable statistics, tests, and analyses, and many instructive photographs of quarries, machinery, exposures, and buildings, and closes with a bibliography of oölites in general and of the Bedford stone in particular.

In the way of minor criticisms abandoned quarries are indicated on the maps, but not those in operation; while the lithographing of the maps is neatly done, the distinctions between formations might have been clearer in some cases without increasing the cost of the maps.

The most serious criticism of the report is one for which the authors are not responsible, but it is one that unfortunately applies to many of our state reports, and is referred to here rather on general principles than on account of it being especially applicable to the present case; we refer to the short time allowed for its preparation. No matter what the worker's aims, intentions, or abilities may be, behind him is the state geologist demanding much work in a short time and at little expense; the state geologist imagines the legislature is making the same demands on himself, while behind the legislature are the people asking for practical results. In our national surveys we have pretty much the same state of affairs—a constant demand for something to show for the money used. As a matter of fact, the practical results of hasty work cannot be the best results. Haste in work of this kind, like haste in other things, is waste. It is our decided opinion that no member of a legislature or of Congress will object to allowing a state or a national geologist time to do good work if only the truth is placed fairly before him. Last year we had a valuable paper by Professor Hopkins on the carboniferous sandstones of Western Indiana; this year we have the present report on the Bedford stone, and some other year we shall have reports on other building materials of Indiana. Thus the matter that ought to have formed a single mono-

graph is scattered through several volumes, disconnected, and therefore less known and less valuable either to the state or to the general public. Nevertheless, the state geologist is to be congratulated on his selection of men to do this work and on the results obtained in so short a time, for it is unquestionably one of the very best reports made in this country upon building stones. J. C. BRANNER.

The Ancient Volcanoes of Great Britain. By SIR ARCHIBALD GEIKIE, F. R. S. Macmillan & Co., London and New York, 1897.

This work, as Sir Archibald Geike states in the introduction, is the outgrowth of his presidential addresses before the Geological Society of London in which he sketched the volcanic action in ancient times in Great Britain, whose record is left in the igneous rocks of several epochs from pre-Cambrian to Tertiary. No other part of the earth, so far as now known, presents within a comparatively small area such evidences of oft repeated volcanic action through so great a period of time. Commencing in pre-Cambrian times with three definitely localized volcanoes, the series is found to have extended through the Cambrian, Silurian, Devonian, Carboniferous, Permian and Tertiary times. The importance of the evidence furnished by so extensive a series of periods of volcanic activity as to the cause of volcanic action, and the source of the materials erupted must be apparent.

Its bearing on the question as to whether volcanic phenomena differed materially in the earlier periods of geological history from those of recent date, is also most valuable. And it is to be noted that the conclusion reached is that they are alike. The presentation of the facts known about these ancient volcanoes involves a description of rocks that were formed in various situations in the volcanoes; upon their surface, within their mass or within rocks beneath or about them; and which were subjected during the ages to processes that have modified their internal character and sometimes their external form. In order that these descriptions may be understood by the general reader the first chapters of the work are devoted to a consideration of general principles and methods of investigation. The nature and causes of volcanic action, and the phenomena connected with modern volcanoes are briefly noted. Considerable space is given to the characteristics of